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*Approval signatures on file with master copy.

Revision/Periodic Review Log

Test Reason:	Test Result:	☐ Passed	☐ Failed
	Test Type:	☐ Full	☐ Partial
Test Date:	Start Time:	Finish Time:	
Tester 1:	Assistant 1:		
Tester 2:	Assistant 2:		

Preparation/Prerequisites:

☐ Inform the experimenter that a test of the laser interlock is being performed.

☐ A qualified SDL laser operator must be available to assist in placing Safeguards (Beam-Dumps) at the output of each laser system as indicated below and to place the laser systems in a "Ready-Mode" where the power supplies will be on with no laser output.

Place beam-dump/safeguards in place and Red-Tag each laser output:

☐ Ti-Sapphire laser (Titanium–Sapphire) - located in the Main Laser Hutch (MLH)

☐ Nd: YAG laser (neodymium:yttrium-aluminum-garnet) - Main Laser Hutch (MLH)

☐ Excimer laser - End Station Laser Area (ESLA)

☐ Nd: YAG laser (neodymium:yttrium-aluminum-garnet) - End Station Laser Area (ESLA)

1. **[*Search Sequence*]**

Press the Start Search button located inside the ESLA.

The start search indicator comes ON _____

Exit the ESLA, close the door, and press the Complete Search Button.

Observe the steady audible warning is a minimum of 13 - 15 seconds. _____

Both "Laser Interlocked" signs comes ON _____ _____

2. Open the door

Intermittent audible alarm sounds for 5 seconds. _____

Both "Laser Interlocked" signs turn OFF _____ _____

Interlock fault indicator comes ON _____

Attempt to secure the ESLA

Cannot complete search - Laser interlock does not activate _____

Reset Interlock fault

3. Press the start search button. Exit the ESLA, close the door and wait.

The Start Search indicator turns OFF in 40 seconds or less. _____

Press Complete Search Button.

Interlock does not activate _____

4. Press the Start Search button. Exit the ESLA and close the door. Press the Complete Search Button. Open the door and close the door within the time-out period and press the Complete Search Button.

   The interlock does not activate _____

5. Search and interlock the ESLA. Press the interlock OFF button

   The laser interlock drops out _____

   Open the door.

   No audible warning sounds. _____

   Interlock fault indicator does not come ON _____

6. At this time the ESLA should not be secured.

   Verify the Faults are cleared on the two YAG power supplies in the Main Laser Hutch (MLH) _____

   Verify Faults are cleared on the Ti-Sapphire power supply laser power supply in the Main Laser Hutch (MLH) _____

   Verify Faults are cleared on the Excimer power supply in the End-Station Laser Area (ESLA) _____

   Verify Faults are cleared on the (ESLH)YAG power supply in the End-Station Laser Area (ESLA) _____

   The ESLA laser shutter is closed. _____

7. Attempt to open the ESLA shutter.

   The ESLA shutter does not Open. _____

8. 8.1) Secure the ESLA and MLH for laser operation (Assistant remains inside).
   8.2) Request the laser operator to turn ON all of the laser power supplies that will be involved with this test and achieve a 'laser ready' state where no laser beam will be transmitted.
   8.3) Open the ESLA laser shutter.

   The ESLA shutter opens _____

   A short audible sound followed by a 2-second audible signal is heard _____

   The 3 power supplies are ON in the MLH _____

   The Excimer power supply in ESLA is ON _____

   The YAG power supply in ESLA is ON _____

9. **[*Pass Through*]**
Press the Internal PASS-Through button. Open the door and exit the ESLA.

The PASS Through button indicator comes ON _____
The shutter remains open _____
The 3 power supplies remain ON in the MLH _____
The Excimer power supply in ESLA remains ON _____
The YAG power supply in ESLA remains ON _____

Close the door within the timeout period.

9 cont. Press the External PASS-Through button.

The PASS Through button indicator goes out _____
The shutter remains open _____
The 3 power supplies remain ON in the MLH _____
The Excimer power supply in ESLA remains ON _____
The YAG power supply in ESLA remains ON _____
Laser security remains active in ESLA _____

10. Press the External PASS-Through button. Open the door and enter the ESLA.

The PASS Through button indicator comes ON _____
The shutter remains open _____
The 3 power supplies remain ON in the MLH _____
The Excimer power supply in ESLA remains ON _____
The YAG power supply in ESLA remains ON _____

Close the door within the timeout period.

Press the Internal PASS-Through button.

The PASS Through button indicator goes out _____
The shutter remains open _____
The 3 power supplies remain ON in the MLH _____
The Excimer power supply in ESLA remains ON _____
The YAG power supply in ESLA remains ON _____
Laser security remains active

11. **[*ESLA Laser Shutter Operation*]** Cycle the shutter Open/Close switch.

The shutter opens and then closes with out any hesitation. _____

12. Open the laser shutter. Press the External PASS-Through button, Open the door, and begin timing.
After no more then 45 seconds the following occurs:

An audible warning sounds for 5 seconds	
The interlock fault LED comes ON	
Laser Interlock drops out	
The shutter closes	
The 3 power supplies remain ON in the MLH	
The Excimer power supply in ESLA Turns OFF	
The YAG power supply in ESLA Turns OFF	
Interlock fault will only reset when F-300 key is turned	

13. **[*Main Entrance Door*]**
Search ESLA. Open the laser shutter. Assure all laser power supplies are ON.
Open the ESLA door.

An audible warning sounds for 5 seconds	
The interlock fault LED comes ON	
Laser Interlock drops out	
The shutter closes	
The 3 power supplies remain ON in the MLH	
The Excimer power supply in ESLA Turns OFF	
The YAG power supply in ESLA Turns OFF	
Interlock fault will only reset when F-300 key is turned	

14. **[*Roll-Up Door*]** Search the Laser ESLA. Open the laser shutter.
Raise the roll-up door up off of the interlock contact.

An audible warning sounds for 5 seconds	
The interlock fault LED comes ON	
Laser Interlock drops out	
The shutter closes	
The 3 power supplies remain ON in the MLH	
The Excimer power supply in ESLA Turns OFF	
The YAG power supply in ESLA Turns OFF	
Interlock fault will only reset when F-300 key is turned	

15. **[*Main Door – Door Stop*]**

Search the Laser ESLA. Open the laser shutter.

Raise the roll-up door approximately ½" to 1" off of the interlock switch.

An audible warning sounds for 5 seconds _____
The interlock fault LED comes ON _____
Laser Interlock drops out _____
The shutter closes _____
The 3 power supplies remain ON in the MLH _____
The Excimer power supply in ESLA Turns OFF _____
The YAG power supply in ESLA Turns OFF _____
Interlock fault will only reset when F-300 key is turned _____

16. **[*Reach-back*]** Search the Laser ESLA. Open the laser shutter.

Insert a block in the opening of the laser shutter assembly to prevent the shutter from closing.

Open the main entrance door

An audible warning sounds for 5 seconds _____
The interlock fault LED comes ON _____
Laser Interlock drops out _____
The shutter closes _____
The 3 power supplies turn OFF in the MLH _____
The Excimer power supply in ESLA Turns OFF _____
The YAG power supply in ESLA Turns OFF _____

Reset Fault

17. **[*Lockout Switch*]**

Secure ESLA for laser & turn On power supply.

Open laser shutter.

Switch from "operate" mode to "Lockout" mode.

Interlock drops out. _____
The shutter closes _____
The 3 power supplies remain ON in the MLH _____
The Excimer power supply in ESLA Turns OFF _____
The YAG power supply in ESLA Turns OFF _____
Interlock fault LED comes ON _____

Attempt to open shutter

Shutter will not Open _____

Reset interlock fault

Attempt to secure ESLA

ESLA security will not activate _____

Switch to "Operate" mode

18. **[*Emergency Stops*]**

Secure ESLA & turn ON all laser power supplies.

Open laser shutter. Press the external Emergency Stop button (**ES#1**).

The 3 power supplies turn OFF in the MLH	_____
The Excimer power supply in ESLA Turns OFF	_____
The YAG power supply in ESLA Turns OFF	_____
The shutter closes	_____
Interlock drops out in ESLA	_____
Interlock fault is ON	_____
Intermittent audible alarm sounds for 5 seconds.	_____
Interlock fault will only reset when F-300 key is turned	_____

Attempt to secure ESLA.

Laser security will not activate.	_____

Reset emergency stop.

19. Secure MLH and ESLA with one person remaining inside & turn ON all laser power supplies.

Press the internal Emergency Stop button.

	ES#2	**ES#3**
The 3 power supplies turn OFF in the MLH	_____	_____
The Excimer power supply in ESLA Turns OFF	_____	_____
The YAG power supply in ESLA Turns OFF	_____	_____
Interlock drops out in MLH	_____	_____
Interlock drops out in ESLH	_____	_____
Interlock fault is ON	_____	_____
Interlock fault will only reset when F-300 key is turned	_____	_____

Reset emergency stop.

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